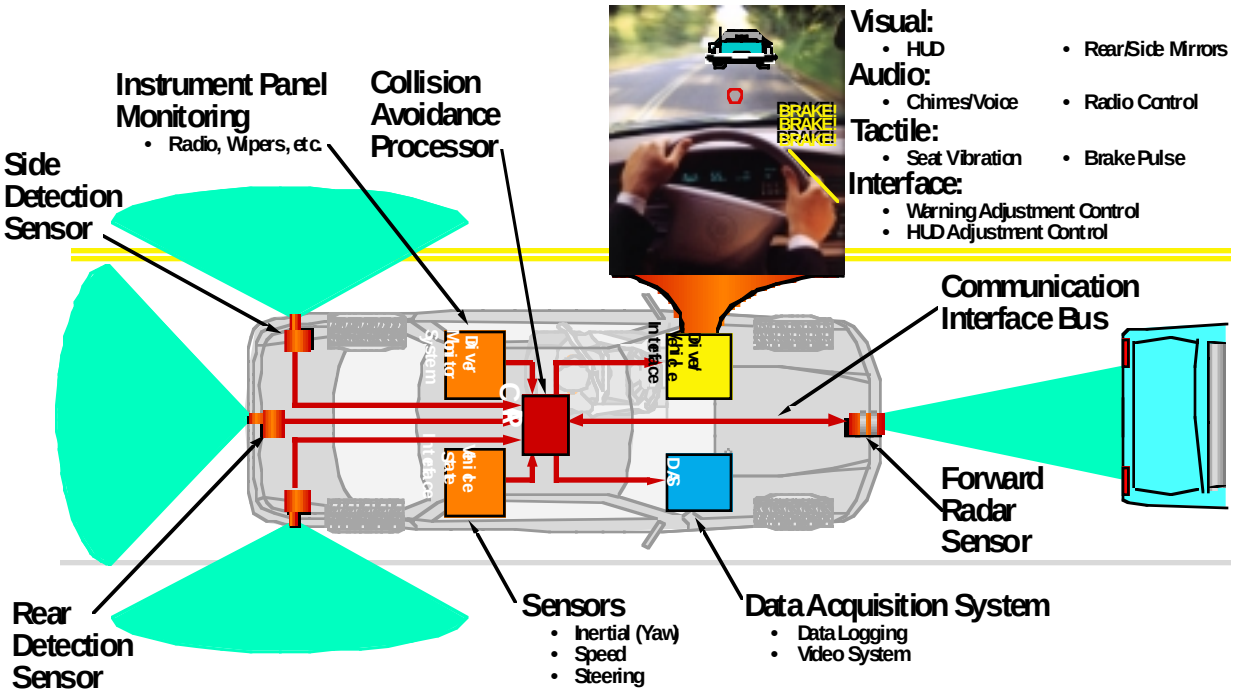

Figure 3.17: Collision Warning Vehicle Mechanization.

A functional description of each FCW demonstration vehicle is provided in detail in the *Task 2.3 Summary Report*. Each successive demonstration vehicle contained noticeably improved design features over the previous vehicle design. Lessons learned from on-road evaluations, and many of the comments provided by numerous subjects on each demonstration vehicle design, were examined and incorporated into the next demonstration vehicle design.

3.4.2 FCW Problem Definition

In order for a FCW system to provide a positive and beneficial influence towards the reduction of potential crashes, it is critical that the FCW system has the ability to correctly identify the vehicle/targets in the Host vehicle's path. The solution to this problem relies primarily on the FCW system's ability to estimate the relative inter-vehicular motion path (i.e.: range, relative speed, radius-of-curvature, etc.) between the Host vehicle and all of the appropriate targets (i.e.: roadside objects, vehicles, etc.), and on the system's ability to predict the mutual intersection of these motion paths. As one could imagine, the in-path target identification and selection problem is technically very complicated and challenging.

Figure 3.18 presents an illustration of the complexity of this problem. In this illustration, it shows a Host vehicle, equipped with a FCW system, which must correctly identify the in-lane target while navigating a random complex roadway segment in the random presence of complex driver/roadway events and rich target environment, while using realistic sensors. Some examples of the realistic driving environment characteristics that are presented to the Host vehicle are: